

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: Michael Powers, et al.
Serial Number: 10/582,735
Filing Date: March 13, 2007
Confirmation Number: 5019
Examiner/Group Art Unit: Brandon Michael Rosati/3744
Title: COLLAR RIB FOR HEAT EXCHANGER
HEADER TANKS

REPLY BRIEF

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TABLE OF CONTENTS

I. STATUS OF CLAIMS	3
II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL	4
III. ARGUMENTS	5
IV. CONCLUSION	13

I. STATUS OF CLAIMS

Claims 10-12, 14 and 17-19 are the claims on appeal.

Claims 10-12, 14 and 17-19 are rejected.

Claims 1-9, 13, 15 and 16 have been cancelled.

II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1) Whether claims 10-12, 14 and 17-19 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of Moreau (U.S. Patent No. 6,749,015, referred to herein as "Moreau") in view of Dey, et al. (U.S. Publication No. 2003/0217838, referred to herein as "Dey"), in further view of Kun et al. (U.S. Patent No. 4,023,618, referred to herein as "Kun").

III. ARGUMENTS

The arguments presented hereinbelow address the Examiner's arguments presented in the Answer dated December 21, 2011. It is submitted, however, that the absence of a reply to a specific rejection, issue, comment, or argument in the Answer does not signify agreement with or concession of that rejection, issue, comment, or argument. Finally, nothing in the following arguments of this reply brief should be construed as an intent to concede any issue with regard to any claim.

A. Whether claims 10-12, 14 and 17-19 are unpatentable under 35 U.S.C § 103(a) as being obvious in view of Moreau, Dey, and Kun.

Regarding independent claims 10 and 19, the Office argues that Kun teaches the tank foot abutting the tube and directly maintaining the tank foot in place. The Office states that this feature is specifically shown in Kun's Figs. 8, 10 and 11. Further, the Office argues that Kun's "element (61) is a continuous piece of material which is the same as reference numeral (60), the tubes. Thus, given its broadest reasonable interpretation, because the material is the same and one continuous piece, the combination of (60 and 63) is deemed to be a tube." (Answer, page 7, § (10)). Appellants assume that "63" in the quote above is a typographical error since the Office made a similar statement in similar context referring to the "combined structure of (60 and 61)" on the previous page of the Answer (Answer, page 6, line 15). Appellants also respectfully point out that Kun states that reference number 63 refers to "notches" (Col. 12, line 62). As such, Appellants assume the Office meant to refer to the fins 61 rather than the notches 63.

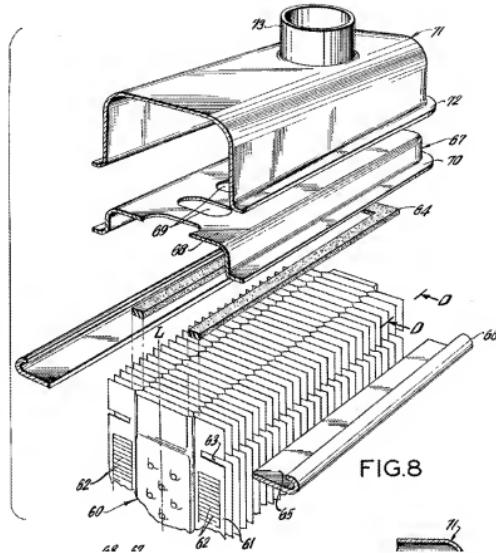
Appellants respectfully disagree with the argument set forth by the Office, and submit that the argument by the Office is contrary to specific evidence and express teachings from Kun, and an improper application of the broadest reasonable interpretation standard.

The underlying meaning of the word "tube" as recited in the claims cannot be dismissed. While the Answer stated that "a tube" is given its broadest reasonable

interpretation, this is not the complete standard. As required by MPEP § 2111, the claims must be given their broadest reasonable interpretation **consistent with the specification**. The Federal Circuit elaborated on this standard by requiring that the broadest reasonable interpretation must be "in light of the specification as it would be interpreted by **one of ordinary skill in the art**" per *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (emphasis added). In the present case, the claimed term "plurality of tubes" is further defined in the claims. As such, the broadest reasonable interpretation of the "plurality of tubes" is not as broad as the Office argues. In sharp contrast, it is respectfully submitted that in order to meet the broadest reasonable interpretation standard, one of ordinary skill should take into account not only the general meaning of the term "tube" as understood in the art, but also the limitations with express basis in the claims.

The Office has argued that fins that are made from the same material as a tube and attached to a tube to form a continuous piece are deemed to be a tube. Appellants respectfully submit that one of ordinary skill would disagree with the Office. Given the definition argued by the Office, any piece of material, no matter how it is shaped and no matter how large it is would be a tube; as long as a tube of the same material was attached as one continuous piece. A plastic film flag welded continuously to a hollow plastic flag pole would be a tube according to the Office's argument.

Further, evidence from Kun has been previously offered that supports the Appellants' argument that the definition of "tube" used by the Office is overly broad. Kun specifically states, at Col. 12, lines 9-12, that "...heat transfer fins 61 **are joined** to the edge wall portions of the channel elements and extend generally outwardly therefrom." This statement clearly indicates that the channel elements/tubes (i.e., the array of elements is labeled 60) are separate and distinguishable from the fins 61. One of ordinary skill in the art would not expect Appellants' tube to read on Kun's large heat transfer fins 61 attached to the channel elements.



Kun's Fig. 8

It is further submitted that the plurality of tubes recited in Appellants' independent claims must be considered in light of the claim as a whole. Appellants' claim does not open interpretation of "plurality of tubes" to the universe of tubes. Rather, it is recited in independent claims 10 and 19 that the plurality of tubes:

- extends from the heat exchanger body part;
- is received in a plurality of slots in the header pan;
- has a ferrule surrounding each tube;
- passes through the plurality of slots; and
- abuts the tank foot, and directly maintains the tank foot in place.

It is submitted that when one of ordinary skill in the art considers whether or not Appellants' plurality of tubes would be considered to include Kun's channel elements

with attached heat transfer fins 61, the answer would be "no, Kun is not teaching Appellants' tubes." Kun's channel elements with the fins attached as shown in Fig. 8 are not capable of being received in a plurality of slots in Kun's header pan. Kun's fins would block insertion into Kun's slots. Kun's fins also render the channel elements incapable of being surrounded by ferrules. As such, Kun's channel elements 60 plus fins 61 cannot be considered to be tubes as recited in Appellants' independent claims 10 and 19 – notwithstanding application of the broadest reasonable interpretation standard.

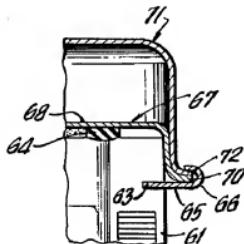


FIG. 10

Kun's Fig. 10

Similarly, it is submitted that the Office has improperly expanded the scope of the term "foot." The Office states that Kun's flange member 70 is "structurally the same as Appellants' tank foot. The Office further argues that [inner tank member] 67 and [outer tank member] 71 are both part of the tank, and thus the "tank foot (70) is deemed to be a tank foot at the end of a tank." Appellants respectfully submit that the argument by the Office is unsound, and does not support the proposition that the fins 61 **abut** the tank foot and **directly** maintain the tank foot in place. As previously submitted, the fins abut the inner tank member 67 – not the flange member 70. The Office's argument that all of the parts are tank parts, therefore the flange member 70 is a tank foot at the end of the tank, does not convey or render obvious a plurality of tubes abutting the tank foot

or directly maintaining the tank foot in place. It is submitted that maintaining the position of a leg by pressing on a shin guard placed over the shin bone is not abutting the foot, and is not directly maintaining the position of the foot.

Regarding the statement by the Office that Appellants improperly argued against references individually on page 12 of the Appeal Brief, Appellants submit that the arguments were appropriate in support of arguments against the overly broad definition of "tube" including attached fins. As stated above, Kun's fins are not tubes as recited in Appellants' claims at least because a combination of Kun's channel elements and fins does not teach the tubes recited in Appellants' claim taken as a whole. It is submitted that it is appropriate to point out that an individual reference from a combination of references does not teach or suggest the claim element(s) for which the Office cited that reference. If such a reference does not teach or suggest the element upon which the combination rejection relied, then the combination rejection fails. As such, it is reiterated that Appellants' arguments were proper.

Still further, the Office argues that both Moreau and Dey disclose tank feet; thus, the combined teachings disclose all of the structural features of the claim. Appellants respectfully submit that the Office cites no authority to support that merely aggregating a tank foot and other structural elements from cited references renders Appellants' claims obvious without also teaching **arrangement of the elements as claimed**.

Regarding teaching, suggestion, or motivation to combine the references, the Office argues that "the fact that it would take more time to build because of extra work required to add the gasket, bares [sic] no consequence on the obviousness to utilize a gasket." Appellants respectfully submit that Appellants' argument was not limited to the time to build, and the courts have stated that the motivation to combine references is important, particularly when a combination involves additional complexity over the prior art. See *In re Omeprazole Patent Litigation*, 536 F.3d 1361 (Fed. Cir. 2008).

The "greater expenditure of time, effort, and resources" argued in the present case are related to one of ordinary skill in the art attempting to create an improved heat exchanger headering arrangement. Manufacturing time is only a portion of the expenditure of time, effort, and resources that must be expended by one of ordinary skill

in the heat exchanger art. For example, in order to incorporate a gasket into a fully brazed heat exchanger, one of ordinary skill may expend resources including: changing the design of all of the adjacent parts, making prototypes, changing production tooling, creating an assembly line where the gasket does not get ruined by the brazing process, arranging logistics, training personnel, performing all functional and durability tests, revising maintenance manuals, adding part numbers to a part numbering system, and selling the idea both to internal and external customers. As such, the articulated reason to combine provided by the Office must be strong enough to overcome, or at least be commensurate with, the many reasons to maintain the *status quo*. It is respectfully submitted that the articulated reasoning provided by the office is based on an unsubstantiated assumption, is contrary to the express teachings of the art that is proposed for combination, and is too weak to provide motivation to overcome the additional work and expense.

The combination proposed by the Office would have required a greater expenditure of time, effort, and resources than Moreau's brazed assembly, with no reasonable expectation of improvement in sealing over brazing. The proposed modification thus would have amounted to extra work and greater expense for no apparent reason. Moreover, even if a person of skill in the art had been attempting to improve sealing of the Moreau tank to header joint, that person would have looked for a modification that would be more compatible with an all-brazed manufacturing process; the skilled artisan likely would have looked away from gaskets.

The courts have stated that an inference that a claimed combination would not have been obvious is especially strong where the prior art's teachings undermine the very reason being proffered as to why a person of ordinary skill would have combined the known elements. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314 (Fed. Cir. 2009). In *DePuy*, the alleged reason to combine the prior art elements of Puno and Anderson—increasing the rigidity of the screw—ran contrary to the prior art that taught that increasing rigidity would result in a greater likelihood of failure.

In the present case, the reasoning articulated by the Office to combine Moreau and Dey is as follows: "modify the teachings of Moreau with the essentially flat gasket

of Dey et al. because adding the gasket would help to ensure a tight fluidly sealed system which would reduce the risk of leakage..." (Answer, page 6). However, Moreau taught that a brazed joint between the aluminum pieces of the header was advantageous for leaktightness.

The invention thus makes it possible to produce a heat exchanger obtained by brazing of metal pieces advantageously based on aluminum. ... Because each manifold offers a flat surface for affixing the manifold plate, that makes it possible to obtain perfect leaktightness between this flat surface and the fluid chamber and to define compartments for the circulation of the fluid in several passes.

... In a general way, the invention makes it possible to simplify the method of assembling the heat exchanger while offering leaktightness.

Moreau, Col. 6, line 65 – Col. 7, line 18. Appellants respectfully point out that not only did Moreau teach away from combining plastic with aluminum, Moreau taught that "perfect leaktightness" could be obtained by implementing Moreau's invention. As such, the motivation for the combination proposed by the Office is obviated because a gasket could not improve on "perfect leaktightness," and would necessarily reduce the simplification of assembly provided by a brazed, all aluminum heat exchanger. Practicing Moreau precludes combination with Dey's plastic tank and flat gasket as proposed by the Office.

As such, the reason proffered by the Office for combining Moreau and Dey-- "reduce the risk of leakage"-- is undermined by the teachings of the art that the Office seeks to combine. Therefore, following the precedent of *DePuy*, the inference of non-obviousness of the present combination is especially strong.

As mentioned above, the Office further argues that "Appellant argues the references individually." It is noted that the Office, not Appellants, proposed attempting to improve Moreau's brazed tank to header joint by incorporating a gasket. Appellants' argument was in rebuttal to the argument presented by the Office. It is respectfully submitted that an individual reference may teach away from combination with another reference by teaching against a reasonable expectation of success. The Office's conclusory statement that "adding a gasket does help to ensure a fluidly tight seal" is

not necessarily true. It is submitted that one of ordinary skill would know that brazed seals are considered reliable in the heat exchanger industry, and that adding a gasket can introduce failure modes that did not previously exist. As shown above, Moreau stated that such a brazed seal provides "perfect leaktightness." As such, even assuming *arguendo* that the references cited by the Office (*in re Keller*, *In re Merck & Co*) stand for the authority stated, the arguments presented by the Appellants were proper in response to the argument presented by the Office.

In view of the arguments stated above, in addition to the arguments set forth in the Appeal Brief filed August 16, 2011, it is again submitted that the combination of Moreau, Dey and Kun fails to render obvious Appellants' claims 10-12, 14, and 17-19.

IV. CONCLUSION

The Appellants respectfully submits that claims 10-12, 14, and 17-19 as currently pending fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112. Accordingly, Appellants respectfully request that the Board of Patent Appeals and Interferences find for the Appellants and reverse the rejection of each of Appellants' claims 10-12, 14, and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Moreau in view of Dey and Kun. In view of the foregoing, favorable consideration and passage to issue of the present application is respectfully requested.

Respectfully submitted,

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